



# Department of Development Services

## Building Division

4701 W. Russell Rd • Las Vegas NV 89118  
(702) 455-3000 • Fax (702) 221-0630

Ronald L. Lynn, Director • Greg Franklin, Assistant Director

---

### **SUBJECT: TG-300-2010 – Adhesive Anchor Special Inspection**

- 1.0 PURPOSE:** The purpose of this Technical Guideline is to provide background and give general direction regarding special inspection of adhesive anchor attachment to concrete.
- 2.0 SCOPE:** Adhesive anchors, being a type of post-installed concrete anchor, are subject to special inspection as specified in Chapter Seventeen of the 2009 International Building Code. Adhesive anchors are evaluated and code compliance established through acceptance criteria and the published evaluation service report. These evaluation service reports have prescribed special inspection responsibilities. This guideline describes when a deviation to the prescribed special inspection is acceptable. The nature of the special inspection deviation is when an installation torque is not required to be verified and reported.

### **3.0 ABBREVIATIONS & ACRONYMS**

**BAC:** Building Administrative Code

**IBC:** International Building Code

**TG:** Technical Guideline

### **4.0 REFERENCES:**

International Building Code  
Clark County Building Administrative Code  
AC 308 - Acceptance Criteria for Post-installed Adhesive Anchors in Concrete Elements  
TG-50 – Final Report Requirements

**APPROVED DATE: September 6, 2010**

**EFFECTIVE DATE: September 6, 2010**

| Revised By:                        | Concurred By:                               | Approved By:  |
|------------------------------------|---|---|
| <i>Stephen T. Toms</i>             | <i>John S. Telford</i>                      | <i>Theodore L. Droessler</i>                          |
| Stephen T. Toms<br>Senior Engineer | John S. Telford, P.E.<br>Principal Engineer | Theodore L. Droessler, P.E.<br>Manager of Engineering |

**5.0 DEFINITIONS:** For the purposes of this technical guideline certain terms, phrases, words and their derivatives shall be construed as specified in this section, the IBC, and the BAC of Clark County.

**Acceptance Criteria** is the means to evaluate acceptance of materials and methods of construction which are not specified within or sufficiently described within the adopted technical codes. Acceptance criteria as used herein are the documents published by ICC Evaluation Service.

**Evaluation Service Reports** are those documents published by ICC Evaluation Service.

**6.0 RESPONSIBILITIES:**

**6.1 Special Inspector**

The special inspector is to review and understand the duties and responsibilities specified within the adopted technical codes and the reporting requirements established by the jurisdiction. Reporting requirements for common special inspection activities are contained within the technical reporting guidelines. The special inspector must also become familiar with materials, installation requirements and special inspection and testing as specified within evaluation service reports.

**7.0 PROCEDURE:**

**7.1 Code basis**

Anchorage to concrete is covered in the International Building Code (IBC), 2006 and 2009 editions, in sections 1911 and 1912. IBC section 1911 – Allowable Stress Design is very limited in scope and does ... “not apply to anchors installed in hardened concrete or where load combinations include earthquake loads or effects.” IBC section 1912 – Strength Design includes cast-in-anchors, expansion anchors and undercut anchors designed in accordance with Appendix D of ACI 318. The strength design provisions of IBC section 1912 specify for “anchors that are not within the scope of Appendix D of ACI 318, design of these anchors “shall be in accordance with an approved procedure.” Therefore, adhesive anchors installed in hardened concrete are not specifically addressed in the code or reference standard and must be considered as an alternate under IBC section 104.11 or based upon an approved procedure. An approved procedure may be those anchors evaluated in accordance with the acceptance criteria established through ICC ES.

Adhesive anchors are addressed within ICC ES reports by application of acceptance criteria AC 308. These reports provide the design criteria, conditions of use, require manufacturer installation instructions, and special inspection provisions. Evaluation service reports for adhesive anchorage currently require the special inspector to verify use in accordance with the manufacturers’ installation instructions. *Adhesive anchor ES reports require verification*

*by the special inspector that the maximum installation tightening torque has not been exceeded.*

## **7.2 Specific conditions – cure time**

Adhesive set anchor bolts must be allowed to cure for a prescribed time prior to any attachment or tightening of nuts. The cure time is dependent upon the type of adhesive being used and the temperature of the base material. Typically, this cure time will be between 12 and 24 hours after initial installation of the anchor. Two visits by the special inspector are necessary in order to properly inspect and document adhesive anchor installations. The first inspection is hole preparation, adhesive and anchor placement. The second inspection is to verify that the maximum recommended installation torque has not been exceeded.

## **7.3 Types of anchors**

It is important to note the two types of adhesive anchor systems which may be evaluated and have reports issued based upon ICC-ES AC 308. The most common system, identified herein as the standard system, is evaluated based upon a select adhesive and a readily available material such as a threaded rod. The second system may use the same adhesive as the standard system but will require the use a proprietary metal anchor. The second system is known as a torque controlled adhesive anchor system.

## **7.4 AC 308 specifics and interpretation**

A maximum recommended installation torque is addressed in AC 308 in various locations. Based upon review of Tables 12.1, 12.2, and 12.3 it becomes clear that AC 308 only requires testing and reporting of an installation torque for torque controlled adhesive anchors. Additionally, the special inspection procedures outlined in AC 308, Appendix A, section 14.3 do not mention any verification of the installation torque.

AC 308 only requires qualification of an installation torque for torque controlled adhesive anchors. The standard adhesive anchor system is not dependent upon an installation torque being specified or applied. The manufacturers' installation instructions include a limiting maximum torque for either system as specified in AC 308, Appendix A, section 8.20.

## **7.5 Evaluation Service Report – deviation for standard adhesive anchors**

*Standard adhesive anchors are subject to the second inspection and verification of torque only when the drawings specify an installation torque.* The special inspector must indicate as part of the initial installation that the drawings require an installation torque or do not have any specification for torque. Anchor installations not requiring tightening to a specified torque shall not require a second inspection. Anchor bolts required to be tightened by application of a specified torque shall be confirmed and reported that the maximum installation torque published by the manufacturer has not been exceeded.

## 8.0 RECORDS:

Special inspection is to be reported as stated herein and as required by the technical reporting guidelines attached to TG-50.

## 9.0 ATTACHMENTS:

None

## 10.0 REVISION HISTORY

| Title       | Revision/Approved Date | Effective Date    |
|-------------|------------------------|-------------------|
| TG-300-2010 | September 6, 2010      | September 6, 2010 |
|             |                        |                   |